

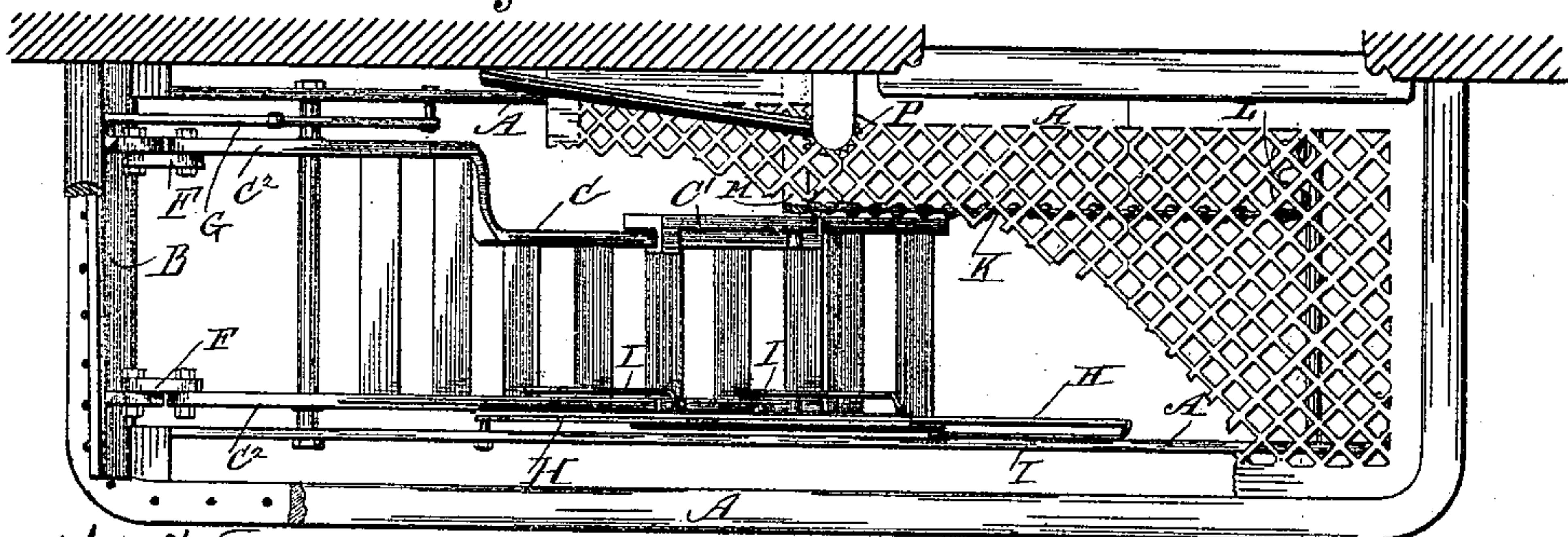
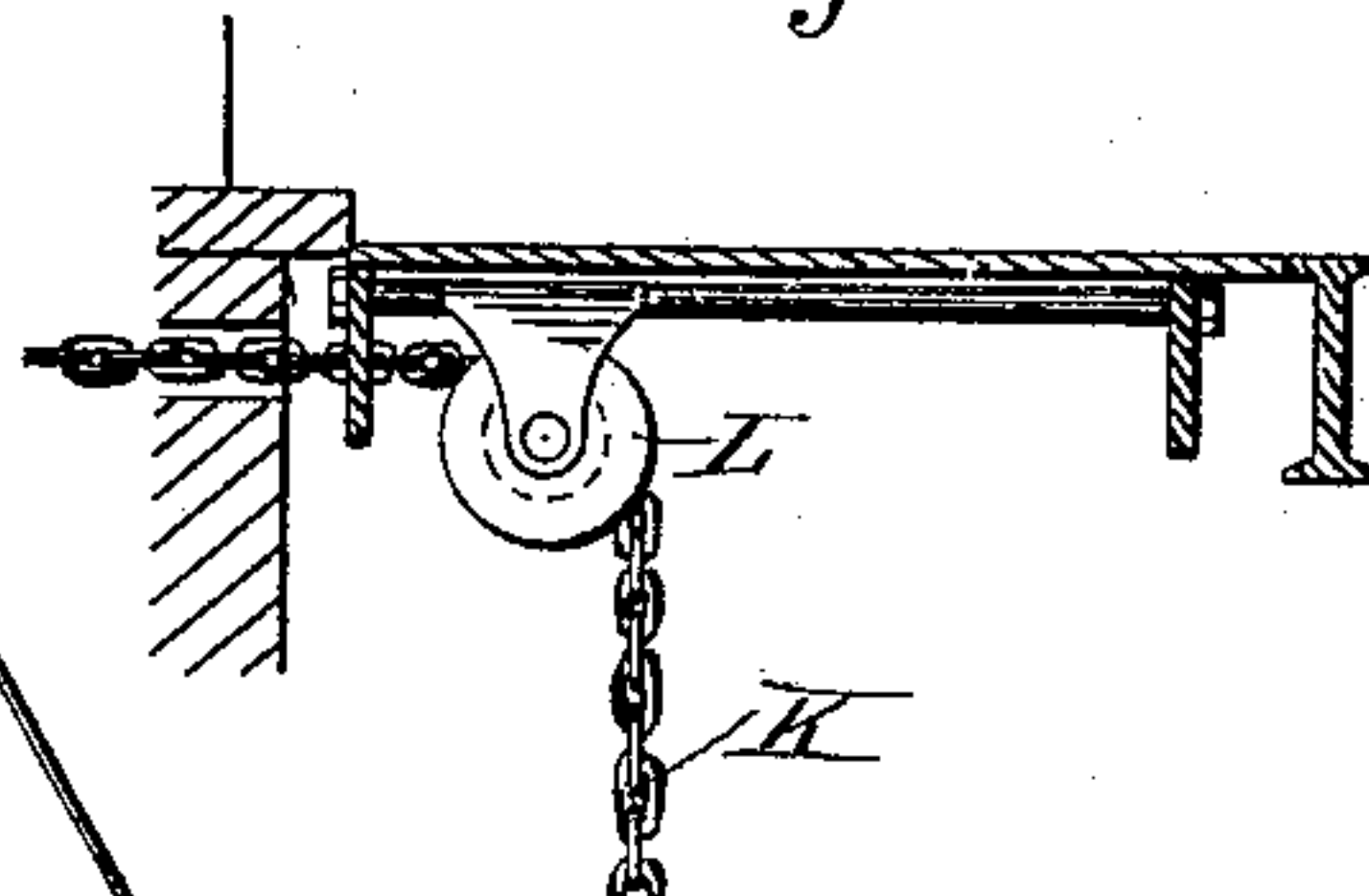
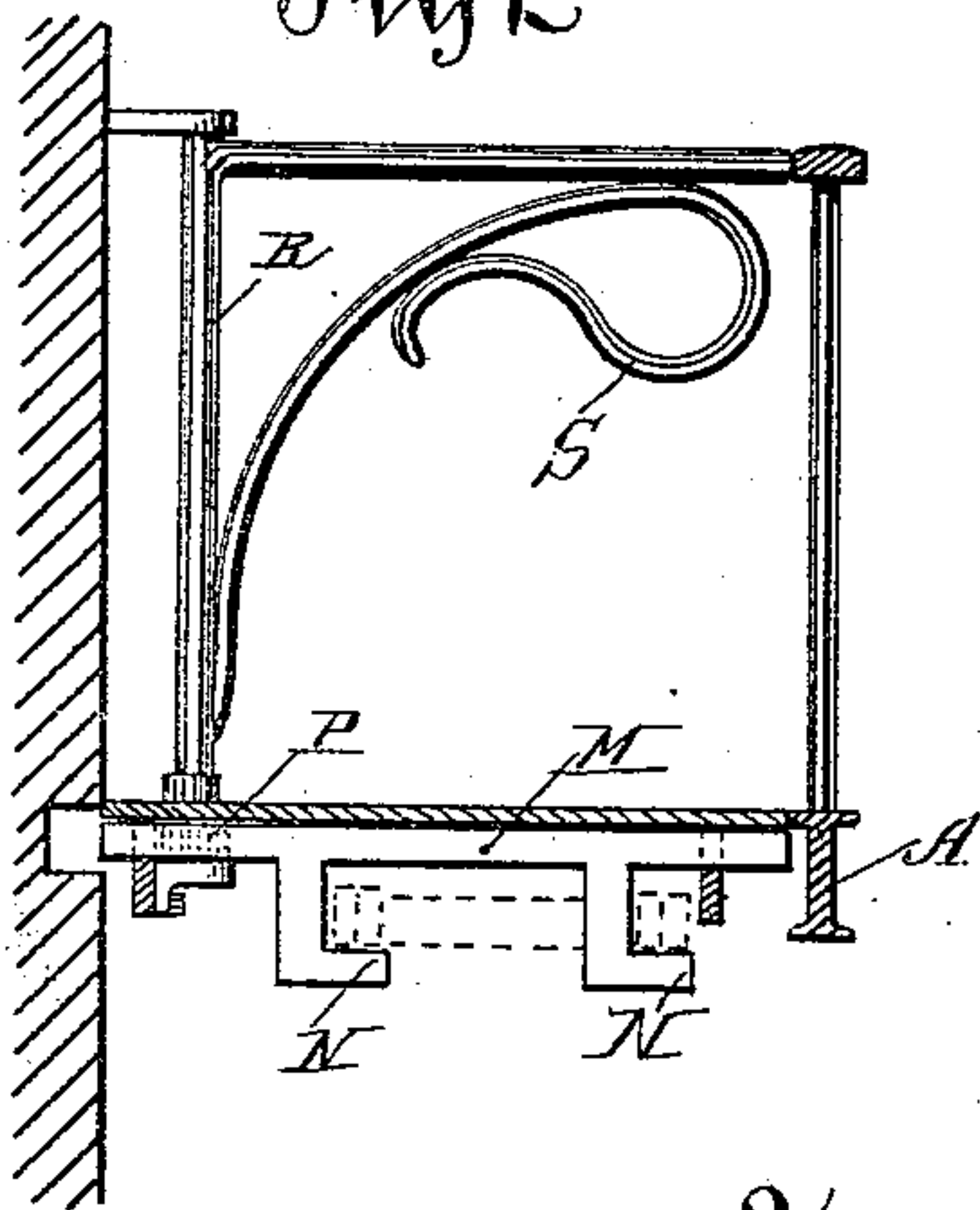
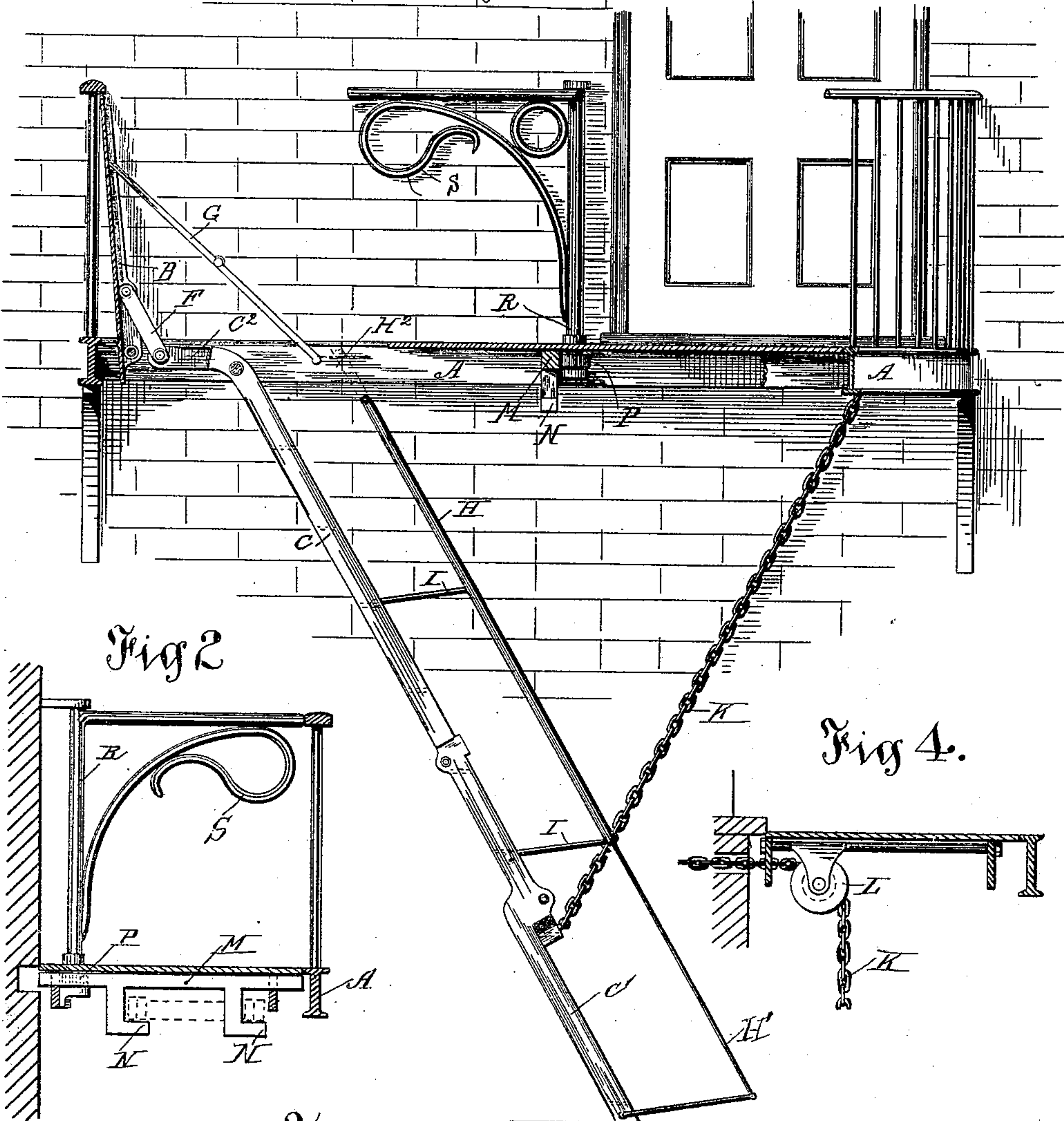
(No Model.)

A. ST. G. CUFF.
LADDER BALCONY.

No. 437,333.

Patented Sept. 30, 1890.

Fig 1.



Inventor. Arthur St George Cuff
by his Attorney. B. E. Hadden

UNITED STATES PATENT OFFICE.

ARTHUR ST. GEORGE CUFF, OF KILBURN, ENGLAND.

LADDER-BALCONY.

SPECIFICATION forming part of Letters Patent No. 437,333, dated September 30, 1890.

Application filed March 11, 1889. Serial No. 302,827. (No model.) Patented in England October 9, 1884, No. 13,379.

To all whom it may concern:

Be it known that I, ARTHUR ST. GEORGE CUFF, a subject of the Queen of Great Britain, residing at 16 Victoria Villas, Kilburn, London, have invented a new and useful Improved Ladder-Balcony, (for which I have obtained Letters Patent in Great Britain, No. 13,379, dated October 9, 1884;) and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to balconies provided with hinged ladders for use in case of fire or other emergency; and it consists in certain improvements therein and relating thereto, as hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a front elevation, partly in section, of a balcony with ladder in position for use, Fig. 3 being a plan view thereof, and Fig. 2 a cross-section, showing more particularly the device for holding up the ladder under the balcony and illustrating the mode of release. Fig. 4 is a detail, partly in section, showing the sheave and chain as it passes through the wall of the building to the counterbalancing-weight within.

The purpose of the improvements is more particularly to simplify the construction, so that the parts may be easier to operate and not liable to get out of order; also, to render such ladders safer for use, more especially for aged persons or children, and furthermore, to render the release of the ladder and the placing of the same and the other parts in position for use, so to speak, automatic, such construction being specially desirable for theaters and other buildings of public resort.

I provide a ladder C below the floor or platform of an ordinary balcony A, which when not in use fits close under the floor and does not alter the appearance of the balcony. One end of the floor or platform of the balcony has an opening or exit-way cut of sufficient size to allow a person to pass through it to the ladder. Where it is desired and the length of the balcony will admit, two or more openings or exit-ways, each provided with a ladder, may be made.

To each opening or exit-way I provide a door or trap B, hinged or pivoted to the balcony.

To each opening or exit-way I provide an iron ladder C, the upper ends of which are extended beyond the hinge or pivot of the ladder and curved, as shown at C². At the extreme end of such curved extension C², I attach a connecting-bar F by a pivot or other convenient mode, the other end of such connecting-bar being pivoted or otherwise hinged to the door or trap B at a suitable distance from the hinge of the latter.

On one or each side of the door or trap, I pivot or otherwise hinge a check-brace G, the other end of such check-brace being pivoted or otherwise hinged to the balcony. In the center of such check-brace I provide a hinge, preferably what is known as a "carriage-hinge," so that when the door or trap is closed it will fold and lie under the door or trap, and as the door or trap opens it will expand and form a brace for the door or exit-way, as well as being a guard-rail for the assistance of persons stepping from the balcony to the ladders. When the ladder is released, it falls by its own weight into an inclined position. As the ladder is falling the curved ends C² are raised, thus forcing up the connecting-bars F and throwing open the trap B and causing at the same time the check-brace G to open out. The steps or treads may be made of flat or rounded T-iron.

Where it is necessary to provide a ladder of greater length than the length of the balcony to which it is fitted, I do so by adding one or more sections C', arranged to slide one above the other telescopically, so to speak.

Each ladder is provided with a hand-rail or balustrade H, which may be formed by a round or half-round bar of iron somewhat shorter than the ladder, fitted to the outside of the ladder by means of standards I, pivoted or otherwise hinged at one end to the side of the ladder and the other end pivoted or otherwise hinged to the hand-rail, one end of the hand-rail or balustrade being pivoted or otherwise hinged to the side of the balcony beside the opening or exit-way, as at H², Fig. 1, the other end being pivoted or otherwise hinged to the lower or last standard. As the ladder descends

the hand-rail or balustrade will rise together with the standards, which will become upright. When the ladder is raised up under the floor of the balcony, the hand-rail or balustrade and the standards collapse and lie alongside of the ladder. It is necessary that the standards should be parallel with the line between the pivots of the hand-rail and ladder, respectively, where the same are connected to the balcony.

When it is necessary to have an additional length of ladder arranged telescopically, I use a metal tube, preferably as employed for gas-pipe, for the hand-rail or balustrade for the top or first length of ladder, and the hand-rail or balustrade of the second or other length of ladder I form of solid round iron H' of a size to admit of its passing into the iron tube forming the hand-rail or balustrade of the upper or first ladder. The other end of the solid round iron is pivoted or otherwise hinged to the standard at the extreme end of the extending ladder, so that when the extending ladder is slid upon the first ladder the solid round iron forming the hand-rail or balustrade will pass into the tube and collapse with it when the ladder is up under the floor of the balcony. As the ladder is falling into an inclined position the extending hand-rail or balustrade will run out with the extending ladder and become upright.

To regulate the ladder as it falls into position and to prevent it falling too fast, I provide a small chain K , which is fastened to the side of the ladder, preferably to the inside, in a convenient position, and then is passed over a swing pulley-wheel L , arranged at the bottom of the balcony and opposite a hole in the wall of the building through which the chain is brought. After being brought into the building it can be carried to any convenient position by being passed over ordinary pulley-wheels. At the end of the chain a weight almost sufficient to counterbalance the weight of the ladder is attached.

To release the ladder automatically, which is most applicable to theaters, music-halls, and places of entertainment where large numbers of persons are congregated and where an exit door or window on the balcony is provided, I provide a metal bar M , which is made the width of the balcony. It may be fitted in the floor of the balcony beside the exit door or window. On the bottom of the bar are two half-square hooks or catches N , which project the depth of the sides of the ladder. The bar with the half-square hooks or catches works backward and forward freely, and has a rack on one side at the end nearest the wall of the building, in which gears a pinion P .

In the center of the ratchet-wheel is a square hole to receive the perpendicular pivot or bar R . I may have the exit-door divided in the center and opening out, and, as also in the case of a window, I would have what is generally known as a "French window," also opening out, the hinged side of the door or win-

dow being connected with the pinion by means of a pivot or other convenient device. As the door or window is pushed open the pinion revolves and draws back the half-square hooks or catches on which the free end of the ladder is resting, and immediately the ladder, being set free, falls into position; or I may arrange, as in the drawings, a gate S across the balcony close beside the exit-door or French window. The back frame of the gate S , forming the perpendicular bar R let into the pinion P , will answer the same purpose, or there may be no gate, only a bar forming a barrier, which when pushed will cause the perpendicular bar R to turn the pinion P , and so release the ladder by removing the half-square hooks or catches.

The swing-pulley L may be carried in a fork L' , supported by a bar L^2 , journaled in the framing of the balcony, so that the pulley L may be able to swing according to the position of the chain K .

I claim—

1. The combination of a balcony, a ladder pivoted thereto, extension c^2 of said ladder beyond its pivotal axis, trap-door R , hinged to said balcony on an axis parallel to the pivotal axis of the ladder, and connecting-bar F , pivoted to said extension c^2 at one end and pivoted to the trap-door R at the other, for operation substantially as set forth.

2. In a balcony having a ladder pivoted thereto and a trap-door to afford access to said ladder, the combination, with the ladder, of the extension c^2 , and connecting-bar F , pivoted to said extension and to the trap-door and guard-rails G , substantially as and for the purpose set forth.

3. In a balcony having an extensible ladder pivoted thereto, the combination, with the ladder and balcony, of an extensible hand-rail H , consisting of a tubular portion pivoted to the balcony and a portion to slide therein, and standards I , pivoted to said hand-rail and to the ladder, substantially as and for the purpose set forth.

4. The combination of a balcony, a ladder pivoted to fold up beneath said balcony, a detent adapted to uphold said ladder when so folded up, and a door on the balcony in connection with and adapted to operate said detent, so that the opening of said door causes the withdrawal of the detent and release of the ladder.

5. The combination of a balcony, a ladder pivoted to fold up beneath the same, a sliding rack-bar M , having hooks N , a pinion P , and a gate S , adapted on opening to move said bar and release the ladder, substantially as set forth.

In witness whereof I have signed this specification in presence of two witnesses.

A. ST. GEORGE CUFF.

Witnesses:

H. I. HADDAN,
R. HADDAN.